

Hampton-court, Barnham, &c., are strictly adhered to. Other brick-ware of an ornamental character, such as quatrefoil panels, finials, corbels, &c., is also there manufactured, of a pure Bath-stone colour and of bright red. His lordship has recently erected a parsonage at Holkham, in the Tudor style, in which all the dressings usually executed in stone have been executed in brick-ware.

The various papers which have appeared in our journal on the manufacture and use of hollow bricks have excited much interest, and have led to many inquiries for farther information, particularly as to where machines may be seen. We will take this opportunity to supply it.

Hollow bricks may be made by any ordinary field tile machine, and there are several manufacturers of these. The Ainsley Company have a patent for a machine, as also for economic kilns. Mr. Clayton has also a patent for a tile machine, and Mr. Burton has recently taken out a patent for compressing any form of pipe, hollow brick, or tile, either plain, moulded, or enriched.\* Mr. T. Scragg, of Tarpotley, Cheshire, also makes tile machines; he made the hollow bricks used in the great arch ceiling over St. George's Hall, Liverpool, described and illustrated by Mr. Robert Rawlinson in our last volume. But, as previously stated, any tile machine will make hollow bricks of any sectional form. Care ought to be taken in making the die so as to arrange the inner side of the plate, that there shall not be any flat face for the clay to impinge against; but the whole surface should slope evenly down to the opening, forming the section of the brick: by this means the clay will be gradually compressed into the form the brick must take, and the surfaces and angles will be preserved smooth and sharp. If the inner portion of the die-plate is flat, as many now are, or has any portion of its surface at right angles with the outward pressure on the clay, a curling motion is given to it, which produces a rugged surface and serrated angles to either bricks or tiles.

In using hollow bricks with dowels, the bricks may be made of any form of section, but having the internal ribs to receive the dowels, as shown in a previous number of our journal.† The bricks will be best made plain, that is, square at each end; the dowels may either be of plain tile or of slate, and they should be fitted and cemented into one end of each brick at the place where they are to be used.‡

One end of each hollow brick will have the requisite dowel inserted, and projecting one-half its depth (or from one inch to one and a half inch) beyond the end of the brick, and this end the bricklayer will set outwards; he will then mortar the bed and joint as for ordinary work, and set the open end of the next brick against the projecting dowel, pressing the joint flush up and cutting off the spare mortar as in ordinary brickwork. The dowels, we should mention, will be indispensable in floors, or in any work where one face or more of the hollow-brick is to be exposed.

We sincerely hope that the Chancellor of the Exchequer, in his forthcoming financial statement, will show that he has not overlooked the advantages that would result to the industry of the country by the removal of the brick duty.

#### DOMESTIC ARCHITECTURE AMONG BARBAROUS RACES. THE INDIAN ARCHIPELAGO.

THE approaching exposition of the industry of all nations has awakened in the public mind a desire to know the progress which has been made by the various races of the world in the useful arts, and thus, in some measure, to forestall the decision made after that exhibition. Among the most curious as well as important branches of the subject is the domestic architecture of barbarous races,—and to this we propose devoting a short descriptive series. We may almost judge of a nation's character, and certainly of its progress in civilization, by an examination of the dwelling house. Enter an English home, and all the parts and arrangements of it indicate the national taste, and the national advancement in domestic art: pass from this to one in Paris, and the change is great; transport yourself to Cairo, and the other capitals of the east; to Florence, and the other cities of the south; to Peking, and the great barbarian towns of Russia, and thence through all the divisions of the globe, and a tour through the dwelling houses of the race will expose to view its customs, tastes, and characteristics. Besides this, it is interesting as well as useful to compare the progress of other nations with our own. The practical builder, as well as the general reader, may derive instruction as well as entertainment from such an examination, which will enable him to compare the dwellings of the Siberian savage, the Celestial barbarian, the Indian islander, the wild man of Australia, and the African doko, with the miniature palaces which form an Englishman's delight.

Recent events have attached to Borneo and the rest of the Indian isles an interest at once general and great. For this reason we have selected the Indian Archipelago as the starting point for our tour of observation through the dwelling houses of barbarous races. Commencing with the great island that has formed the theatre of Sir James Brooke's principal exertions in the cause of humanity, we find in it many distinct styles of domestic architecture in different provinces. In the piratical district of the Rejang, and that part inhabited by the Sarebas, Sakarran, and Kanowit pirates, we find villages of singular construction. The houses are erected on piles 40 feet in height: they are framed with strong timbers, flanked at the sides with bamboo, and thatched with atap, or the leaves of a certain tree. A broad balcony runs round each dwelling, and in this the inmates sit in the cool of evening to enjoy the soft air. The supporting piles are strong and thick, so that when one of these villages was attacked by the pirates, it took them several hours to back through them, until at length the weight of the superincumbent mass of building brought the whole down with a tremendous crash. But this class of dwellings is not common. In other districts a village consists of one huge house, with many entrances, erected on short piles, with a platform running along the whole front. To this the means of ascent is by notched poles, passing up through openings in the elevated stage, and drawn up at night. The great house is low, with a heavy slanting thatched roof. Here and there a projecting portion, like a large attic window, allows room for ingress. The whole is roughly built of branches of trees and bamboos, coarsely wrought, but firmly jointed together. The exterior has the appearance of a street of old English farm-sheds, half ruined; but in the interior we find much neatness and comfort, the apartments being divided one from another by woven screens of rattans, while along the walls are fixed hollow trunks of trees, to serve as couches. These rather resemble short manglers for cattle than places of repose; but when darkness fills the building, and only a red glare is emitted by the smouldering heap of fire in the midst, these wooden couches, with their dark occupants buried in sleep, present a singularly snug appearance, especially as fine mats are employed for warmth, to cover the slumberers, carpet the floor, tapestry the walls, and line the roof. At the end of each village of this kind is an octagonal building, called the head house, where the trophies of war are kept, and festive meetings celebrated.

In other parts of Borneo we find the savages dwelling in small circular edifices, built among the branches of trees; in others, inhabiting little low huts, forming a cluster, buried in some deep woody hollow; in others, swarming in vast buildings lying along the banks of rivers and consisting of piles of connected timbers without plan or regularity, erected one against the other as the tribe swells its numbers; but notwithstanding its outward rude aspect, evincing that taste for animal comfort for which most savages are remarkable. Some of the Sarawak chiefs possess dwellings of extreme neatness and beauty, erected with no little skill, on low piles, ascended to by ladders, well thatched, and surrounded by palisades. In a few of them may be traced a resemblance to the primitive Swiss cottage, with its broad eaves overhanging the verandah. The Lundi Dyaks dwell in houses which the English cottager would admire, and, indeed, closely resembling, is everything but their elevation from the ground, the habitations of our peasantry. The houses possessed by the fierce and formidable pirate tribes of Borneo present every appearance of comfort, and many of them are remarkable for the skilful joining of the timbers and planks, considering that few nails are used, and very rude tools employed.

The general materials used in the construction of the houses of the Indian islanders are bamboo, rattans, the palmetto leaf, atap, and wild grass. The supporting posts are of timber or bamboo, the walls of plaited bamboo flattened, the roofs of grass or palmetto leaves, the first most commonly used among the rural tribes, the second among the coast dwellers. In a brief sketch like the present we must not pause to enter into too minute details, but leaving Borneo with this desultory glance, turn to the other islands of the Archipelago.

These afford the spectacle of many species of human dwelling, from the rude hollow tree of the Papuan or Peninsula savage to the comfortable house of the Javan labourer, or the still more commodious residence of his prince or chief. Mr. Crawford, whose book is remarkable for being ill-arranged and incomplete, still affords some interesting information on this point; but Forrest, the enterprising voyager, has given us a far better account. He visited one of the largest class of structures inhabited by the New Guinea negroes. It was built on posts, fixed many yards below low water mark, so that the tenement perpetually hung over the waves. The house consisted of one vast hall, common to a whole tribe, and numerous apartments opening into it on either side. At either end was an elevated stage, with a door at the outer extremity opening on the sea, at the inner looking on the jungle, and on the platform were many canoes, of various sizes, drawn up, but ready to launch at a moment's warning. The double entrance was designed for safety. In case of an attack on the land side, the inmates of this extraordinary dwelling took to their boats, and escaped by sea; if threatened by water they fled into the Indian jungle. Only the married people, unmarried women, and children dwelt in this house. The bachelors occupied small separate buildings, erected on more substantial posts, further out at sea.

All the native dwellings in the Archipelago are constructed of perishable materials; but the islanders have dedicated to their gods temples of more substantial structure than those consecrated to their own comforts. Great edifices have been reared in Java for the worship of deities, whose very appellations have been forgotten; but the temples remain—records of skill, industry, and wealth, while the dwellings of the people appear to perish with every generation: even king's palaces are composed of materials that decay within a few years of their erection.

As we have said, the habitations of the tribes of the Indian islands divide themselves into two classes—those inhabited by the maritime, and those of the agricultural tribes. Of the first are those of the Malays, of most of the inhabitants of Sumatra, Borneo, and Celebes; of the second, those of the Javans, the Balivese, and others. The first are erected on posts, and the access to them is by a rude ladder, or the still more primitive means of a notched tree-trunk. The piles vary in height, from six to forty feet, and are large or small, according to the weight of the superstructure. Underneath is a sort of piazza, generally very

\* These parties have establishments in London.

† See page 83, ante.

‡ This work may be done most cheaply by a boy or labourer, either by contract, at so much per hundred or thousand, or by day work: the bricks so prepared may be stacked ready for use, and the bricklayer will have nothing to do but to set them as he would ordinary bricks.